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(b) repeatedly generating for testing and adjustment purposes the presence of one of said selectable predetermined waveforms for a predetermined duration and which waveform is routed to the record input of the tape recorder;

(c) receiving the output of the playback head and providing a corresponding digital signal thereof;

(d) receiving the digital signal and converting the digital signal by a Fast Fourier Transform (FFT) into digital data representative of elementary components thereof; and

(e) receiving and analyzing the digital data to determine the performance of the tape recorder.

REMARKS

The specification, in particularly, pages 15 and 16 have been amended to correct for typographical errors related in the quantities given in expressions 1 and 2.

Before discussing the rejections of the present Office Action, a brief review of applicant's invention is in order.

In one embodiment, the invention comprises a system and a method of operation thereof that employs digital techniques to automatically verify the operational performance of a tape recorder, with special attention given to detecting tape recording dropout occurrences and unclear read/write (playback) heads. The system comprises a signal generator that includes a serial arrangement of a microcontroller and a digital-to-

analog converter for repeatedly generating, for testing and adjustment purposes, the presence of a predetermined waveform for a predetermined duration which is routed to the record input of a tape recorder.

More particularly, as disclosed on page 23, line 8 through page 24, line 5, in one embodiment, the system allows for adjustments to be made on a closed-basis with a microprocessor selecting the desired values, looking for the actual values and making the selection and adjustments so that the desired and actual values are substantially equal to each other. In this embodiment, the invention allows for properly adjusting the bias and equalization levels of a tape recorder.

Claims 1, 3, and 6 stand rejected under 35 USC §102(b) as being anticipated by Andersen (4,891,716). Claims 1, 3, and 6 have been cancelled and therefore this rejection requires no further discussion.

Claims 1, 3, and 6-7 also stand rejected under 35 USC §102(b) as being anticipated by Cabot (5,420,516). As previously mentioned, claims 1, 3, and 6 have been cancelled, therefore claim 7 is the only claim in need of further discussion.

With regard to claim 7, the Examiner states that "Cabot discloses that the signal generator repeatedly generates the predetermined waveform during the predetermined duration (Col. 5, lines 49-51; implicit that the predetermined waveform repeatedly generated)." The implicit repeated generation suggested by the Examiner is not supported by Cabot. More particularly, the subject matter of Col. 5, lines 49-51 is further

described by Cabot at Col. 5, lines 54-56, stating “That is referred to hereinafter as a signal generation time block or “generation block.” The time block or generation block of Cabot is not that of applicant’s invention of repeatedly generating a predetermined waveform. More particularly, Cabot et al is devoid of applicant’s invention recited in claim 1 as follows:

(a) a signal generator comprising a serial arrangement of a microcontroller and a digital-to-analog converter repeatedly generating for testing and adjustment purposes the presence of a predetermined waveform for a predetermined duration which is routed to the record input of the tape recorder.

Nothing within the four corners of Cabot anticipates or renders obvious applicant’s recited claim 7.

For the reasons given hereinabove, it is respectfully solicited that the 35 USC §102(b) rejection of claim 7 be withdrawn and that claim 7 be found allowable.

Claims 9-11 stand rejected under 35 USC §103(a) as being unpatentable over Cabot (5,420,516). Applicant has cancelled claims 9 and 10 and therefore claim 11 need only be further discussed.

Claim 11 has been amended to be written in independent form and essentially recites the same subject matter as claim 7. Claim 11 is considered patentably

distinguishable over Cabot based on the reasons given for the distinction of claim 7 over Cabot as previously discussed with regard to the 35 USC §102 rejection based on Cabot.

For the reasons given hereinabove, it is respectfully solicited that the 35 USC §103 rejection of claim 11 be withdrawn and that claim 11 be found allowable.

Claim 10 stands rejected under 35 USC §103(a) for being unpatentable over Andersen (4,891,716). Claim 10 has been cancelled and therefore requires no further discussion.

Claim 2 stands rejected under 35 USC §103(a) as being unpatentable over Andersen (4,891,716) as applied to claim 1 and further in view of Webb et al (3,567,861). Claim 2 has been cancelled and therefore requires no further discussion.

Claim 2 further stands rejected under 35 USC §103(a) as being unpatentable over Cabot (5,420,516) as applied to claim 1 above and further in view of Webb et al (3,567,861). Claim 2 has been cancelled and therefore requires no further discussion.

For the reasons given hereinabove, it is respectfully solicited that the 35 USC §102 and §103 rejections claims 7 and 11 be withdrawn and that these claims be found allowable.

In summary, it is believed that claims 7 and 11 are now in condition for allowance and such allowance is respectfully requested.

Respectfully submitted,

KENNETH M. PROCKUP

By:

Ron Billi
Attorney for Applicant
Registration No.: 34,085
Office of Counsel
Bldg. 435; Suite A
NAWC Aircraft Division
47076 Liljencrantz Rd; Unit #7
Patuxent River, MD 20670

Telephone: (301) 342-9559
Facsimile: (301) 342-1840



VERSION SHOWING THE CHANGES MADE

Page 15, line 3 through page 16, line 13 has been amended as follows:

FIG. 3 illustrates a non-linear plot 96 which leads to unacceptable distortion levels of the modulated waveform at the frequency range related to the present invention which includes the frequencies that are specified in the Y axis of FIG. 3. FIG. 3 has an X-axis given in terms of the voltage (variactor voltage (V)) potential applied across the variactor diode of the transmitter 86. The characteristics of the non-linear plot 96 can be modeled using the below expression 1:

$$\begin{aligned} f = & 162.37 + 0.3293[C] \bullet \ln(v) + 0.0696[C] \bullet \ln(v)^2 [5] \\ & - 0.0417[C] \bullet \ln(v)^3 [B0] - 0.0362[C] \bullet \ln(v)^4 + 0.0795[C] \bullet \ln(v)^5 \\ & - 0.0417[C] \bullet \ln(v)^6 + 0.0069[C] \bullet \ln(v)^7 \end{aligned} \quad (1)$$

where v is the voltage potential across the variactor diode given in volts, and
[/] f is the output carrier frequency in Mhz of the transmitter 86.

By utilizing the characteristics defined by expression (1), the correct amount of second harmonic predistortion, previously mentioned with reference to microcontroller 72, can be determined. For example, let v_0 represent the dc bias voltage potential across the variactor diode within the transmitter 86, v_1 represent the voltage potential across the variactor diode at the positive peak of an undistorted sinewave source, and v_2 represent the voltage potential across the variactor diode at the negative peak of an undistorted

sinewave source. Let f_0 , f_1 , and f_2 represent the carrier frequency as applied by the above expression (1), for v_0 , v_1 and v_2 respectively. The amount of second harmonic distortion (A) to predistort the sinewave is given by the below expression (2):

[0]

(2)

$$A = \frac{f_0 - \left(\frac{f_1 + f_2}{2} \right)}{f_1 - f_2}$$

Claim 7 has been rewritten as follows:

7. [The] A system [according to claim 1, wherein said signal generator] for analyzing the performance of a tape recorder having a record input and a playback head providing an output thereof, said system comprising:

(a) a signal generator comprising a serial arrangement of a microcontroller and a digital-to-analog converter for repeatedly generating for testing and adjustment purposes [generates said predetermined waveform during said predetermined duration.] the presence of a predetermined waveform for a predetermined duration which is routed to the record input of the tape recorder;

(b) an analog-to-digital converter receiving the output of the playback head and providing a corresponding digital signal thereof;

(c) a digital signal processor that receives the digital signal and converts it into digital data representative of elementary components thereof; and

(d) means for receiving and analyzing the digital data to determine the performance of the tape recorder.

Claim 11 has been rewritten as follows:

11. [The] A method [according to claim 10, wherein said predetermined waveform is] for analyzing the performance of a tape recorder having a record input and a playback head providing an output thereof, said method comprising the steps of:

(a) providing a signal generator comprising a serial arrangement of a microcontroller and a digital-to-analog converter, said microcontroller having a look-up table comprising a plurality of selectable predetermined waveforms each in a digital format;

(b) repeatedly generating for testing and adjustment purposes the presence of one of said selectable predetermined waveforms for a predetermined duration [generated during said predetermined duration] and which waveform is routed to the record input of the tape recorder;

(c) receiving the output of the playback head and providing a corresponding digital signal thereof;

(d) receiving the digital signal and converting the digital signal by a Fast Fourier Transform (FFT) into digital data representative of elementary components thereof; and

(e) receiving and analyzing the digital data to determine the performance of the tape recorder.